California Regional Water Quality Control Board
North Coast Region

CLEANUP AND ABATEMENT ORDER NO. R1-2001-26

FOR

UNION PACIFIC RAILROAD COMPANY
736 BROADWAY
EUREKA, CALIFORNIA

Humboldt County

The California Regional Water Quality Control Board, North Coast Region, (hereinafter Regional Water Board) finds that:

1. Beginning in the late 1800s, Northwestern Pacific Railroad Company owned property located at 736 Broadway in Eureka, consisting of Assessor Parcel Numbers 03-021-09, 03-031-06, and 03-041-07, hereinafter the "Site" (Attachment).

2. Union Pacific Railroad Company is the successor in interest to Southern Pacific Transportation Company, also known as Northwestern Pacific Railroad Company. Union Pacific Railroad Company currently owns the Site and is hereinafter referred to as the "Discharger".

3. The Site was used as a railroad switching, maintenance, and freight yard from the late 1800s until the mid 1980s. In 1888 most of the Site was undeveloped tidal marsh except for one railroad track that traversed north to south along the present northwestern Site boundary. Beginning in the late 1800s and continuing into the early 1900s, the tidal marsh was filled. The railroad maintenance buildings were subsequently constructed.

4. Operations at the former railroad yard included fueling and repair of locomotives and railroad cars. Locomotive fueling occurred at the service and refueling platforms. From the early 1900s to 1954, Bunker C oil was used as the primary fuel for the locomotives and it was stored in a 650,000-gallon aboveground storage tank (AST).

5. After 1954, the walls of the Bunker C oil AST were cut down to make a secondary containment structure for two 12,700-gallon diesel ASTs. These tanks, and their replacements in 1979, were used until 1984. Three underground storage tanks (USTs) ranging from 600 to 2500 gallons in size reportedly stored leaded gasoline onsite. The USTs were removed in 1988 and associated groundwater sampling showed contamination, indicating a release of petroleum hydrocarbons to the environment had occurred.

6. Repair and maintenance of the physical parts of the locomotive engines and passenger cars were conducted on the Site. Site activities that involved hazardous materials included draining of waste oils, battery replacement, degreasing and lubricating locomotive engines and train passenger cars, refueling engines, and draining and replacement of various essential engine fluids.

7. Union Pacific Railroad Company has conducted numerous phases of investigation from 1988 to the present. Investigation results indicate that past spills and disposal activities at the Site have resulted in the release of several contaminants to the environment including Bunker C oil, diesel, gasoline, motor oil, polynuclear aromatic hydrocarbons (PNAs), arsenic, copper, lead, zinc, and chlorinated volatile organic compounds.

8. Residual petroleum is present at varying concentrations in the soil throughout the former operational areas ranging from < 10 mg/kg to 28,000 mg/kg. Lead and copper in excess of hazardous waste criteria are found primarily in the former oil disposal pit area. Elevated concentrations of arsenic up to 520 mg/kg are found predominantly along the railroad tracks in the northern portion of the Site. Petroleum, metals, and related contaminants have been detected sporadically in groundwater.

9. Investigation results confirm impacts and potential impacts to Site soils and groundwater. Cleanup and abatement activities remain to be performed at the Site. These activities include: a) conducting a feasibility study assessing remedial alternatives, b) performing appropriate cleanup and abatement activities, and c) performing ongoing verification monitoring. The remaining activities require a schedule for completion and this Order reflects the schedule for completion of required activities.

10. Site groundwater has been impacted with petroleum hydrocarbons. Designated beneficial uses of areal groundwater include domestic water supply, agricultural water supply, and industrial water supply.

11. Surface waters are threatened by the discharges at the Site. Intermittent wetlands exist on the Site, which is located adjacent to Clark Slough and is within 250 feet of Humboldt Bay. The existing and potential beneficial uses of onsite wetlands, Clark Slough, and Humboldt Bay include:

    a) industrial service supply
    b) industrial process supply
    c) navigation
    d) water contact recreation
    e) non-contact water recreation
    f) commercial and sport fishing
    g) preservation of areas of special biological significance
    h) wildlife habitat

i) rare, threatened, or endangered species
j) marine habitat
k) migration of aquatic organisms
l) spawning, reproduction or early development
m) shellfish harvesting
n) estuarine habitat
o) aquaculture

12. The discharger named in this Order has caused or permitted, causes or permits, or threatens to cause or permit waste to be discharged where it is, or probably will be, discharged into waters of the State and creates, or threatens to create, a condition of pollution or nuisance. The discharge and threatened discharge of contaminants has unreasonably affected water quality in that the discharge or threatened discharge is deleterious to the above described beneficial uses of State waters, and has impaired water quality to a degree which creates a threat to public health and public resources and therefore, constitutes a condition of pollution or nuisance. These conditions threaten to continue unless the discharge or threatened discharge is permanently cleaned up and abated.

13. The California Water Code, and regulations and policies developed thereunder require cleanup and abatement of discharges and threatened discharges of waste to the extent feasible. Cleanup and abatement activities are to provide attainment of background levels of water quality, or the highest water quality, which is reasonable, if background levels of water quality cannot be restored. Alternative cleanup levels greater than background concentrations shall be consistent with the maximum benefit to the people of the State, not unreasonably affect present and anticipated beneficial uses of such water, and not result in water quality less than prescribed in the Water Quality Control Plans and Policies adopted by the State and Regional Water Boards.

14. Water quality objectives exist to ensure the beneficial uses of water. The highest beneficial use to be protected at or near the Site varies, and the most stringent objective for protection of all beneficial uses is selected as protective for water quality. The following table sets out water quality objectives for this Site:

Groundwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Total Petroleum Hydrocarbons As Gasoline	< 50	50	Published literature provides a taste and odor threshold of 5 ug/l which is applied to the narrative TASTE and ODOR objective of the Basin Plan for domestic supply, but detection limit is 50 ug/l and is controlling

Groundwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Total Petroleum Hydrocarbons As Diesel	< 50	56	USEPA health advisory of September 4, 1992, Suggested No Adverse Response Level of 56 ug/l which is applied to narrative TOXICITY water quality objective for domestic supply in the Basin Plan
Total Petroleum Hydrocarbons As Motor Oil	< 175	175	SNARL of 0.1 ug/l to 1.0 ug/l is applied to the narrative TOXICITY objective in the Basin Plan and Oil and Grease criteria of the Basin Plan, but detection limit is 175 ug/l and is controlling
Benzene	< 0.1	0.35	Cal/EPA Cancer Potency Factor applied to TOXICITY water quality objective in the Basin Plan.
Toluene	< 0.5	42	USEPA taste and odor threshold, Federal Register 54(97): 22064-22138; applied TASTE AND ODOR water quality objective. There is a less stringent CA Dept. Health Services action level of 100 ug/l applied to the TOXICITY water quality objective in the Basin Plan.
Ethyl Benzene	< 0.5	29	USEPA taste and odor threshold, Federal Register 54(97): 22064-22138; applied to the narrative TASTE AND ODOR water quality objective. There is a less stringent CA MCL of 580 ug/l.
Xylenes	< 0.5	17	USEPA taste and odor threshold, Federal Register 54(97):22064-22138; applied to the TASTE AND ODOR water quality objective in the Basin Plan.
Acenaphthene	< 1	20	USEPA taste and odor threshold, Federal Register 54(97):22064-22138; applied to the narrative TASTE AND ODOR water quality objective in the Basin Plan .

Groundwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Acenaphthylene	< 1	None available	None available
Anthracene	< 1	2100	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan.
Benzo(a)anthracene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Benzo(b)fluoranthene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Benzo(k)fluoranthene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Benzo(g,h,i)perylene	< 1	None available	None available
Benzo(a)pyrene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.0029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Chrysene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Dibenz(a,h)anthracene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.0085 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
Fluoranthene	< 1	280	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan

Groundwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Fluorene	< 1	280	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan
Indeno(1,2,3-c,d)pyrene	< 1	1.0	Cal/EPA Cancer Potency Factor of 0.029 ug/l applied to the narrative TOXICITY water quality objective in the Basin Plan, but detection limit is 1 ug/l and is controlling.
2-methylnaphthalene	< 1	None available	None available
Naphthalene	< 1	14	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan
Phenanthrene	< 1	None available	None available
Pyrene	< 1	210	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan
Polynuclear Aromatic Hydrocarbons (PAH) [1]	< 1	None available	None available
Phenol	< 1	5	California Department of Health Services, taste & odor threshold, applied to the narrative TASTE AND ODOR water quality objective in the Basin Plan.
Arsenic	variable; site specific data required;	0.1	California EPA cancer potency factor level for drinking water of 0.023, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 0.1 ug/l and is controlling
Barium	variable; site specific data required	490	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan

[1] For sum of acenaphthylene, anthracene, benz(a)anthracene, benzo(a)anthracene, benzo(b)fluoranthene, benzo(k)fluoranthene, benzo(g,h,i)perylene, benzo(a)pyrene, chrysene, dibenz(a,h)anthracene, fluorene, indeno(1,2,3-c,d)pyrene, phenanthrene, and pyrene.

Groundwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Copper	variable; site specific data required;	170	California public health goal in drinking water, applied to the narrative TOXICITY objective in the Basin Plan
Lead	variable; site specific data required;	4.1	California EPA cancer potency factor level for drinking water applied to the narrative TOXICITY objective in the Basin Plan
Zinc	variable; site specific data required;	2100	USEPA IRIS reference dose, applied to the narrative TOXICITY objective in the Basin Plan

Freshwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Total Petroleum Hydrocarbons as Gasoline	< 50	None available	None available
Total Petroleum Hydrocarbons as Diesel	< 50	None available	None available
Total Petroleum Hydrocarbons as Motor Oil	< 175	175	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection is 50 ug/l, but detection limit is 175 ug/l and is controlling
Acenaphthene	< 1	520	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Acenaphthylene	< 1	None available	None available
Anthracene	< 1	None available	None available
Benzo(a)anthracene	< 1	None available	None available
Benzo(b)fluoranthene	< 1	None available	None available
Benzo(k)fluoranthene	< 1	None available	None available
Benzo(g,h,i)perylene	< 1	None available	None available
Benzo(a)pyrene	< 1	None available	None available
Chrysene	< 1	None available	None available

Freshwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Dibenz(a,h)anthracene	< 1	None available	None available
Fluoranthene	< 1	3980	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Fluorene	< 1	None available	None available
Indeno(1,2,3-c,d)pyrene	< 1	None available	None available
2-methylnaphthalene	< 1	None available	None available
Naphthalene	< 1	620	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Phenanthrene	< 1	None available	None available
Pyrene	< 1	None available	None available
Phenol	< 1	2560	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Arsenic	variable; site specific data required;	150	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan
Barium	variable; site specific data required	None available	None available
Copper	variable; site specific data required;	2.7 – 9 dependent on CaCO3 hardness	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 2 ug/l and is controlling

Freshwater Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Lead	variable; site specific data required;	0.54 – 2.5 dependent on CaCO3 hardness	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 3 ug/l and is controlling
Zinc	variable; site specific data required;	36 – 120 dependent on CaCO3 hardness	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan

Enclosed Bays and Estuaries Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Total Petroleum Hydrocarbons as Gasoline	< 50	None available	None available
Total Petroleum Hydrocarbons as Diesel	< 50	50	U.S. EPA 1976 Water Quality Criteria, Marked tainting of oysters at 10 ug/l applied to the narrative TASTES AND ODORS objective of the Basin Plan, but detection limit is 50 ug/l and is controlling
Total Petroleum Hydrocarbons as Motor Oil	< 175	175	U.S. EPA 1976 Water Quality Criteria, Marked tainting of oysters at 10 ug/l applied to the narrative TASTES AND ODORS objective of the Basin Plan, but detection limit is 175 ug/l and is controlling
Acenaphthene	< 1	500	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Acenaphthylene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed

Enclosed Bays and Estuaries Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
			toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Anthracene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Benzo(a)anthracene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling
Benzo(b)fluoranthene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling
Benzo(k)fluoranthene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling
Benzo(g,h,i)perylene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Benzo(a)pyrene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling

Enclosed Bays and Estuaries Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Chrysene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling
Dibenz(a,h)anthracene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan
Fluoranthene	< 1	16	U.S. EPA National Ambient Water Quality Criteria, Freshwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Fluorene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Indeno(1,2,3-c,d)pyrene	< 1	0.049	California Toxic Rule 30-day average for aquatic organism consumption, applied to the narrative TOXICITY objective in the Basin Plan, but detection limit is 1 ug/l and is controlling
2-methylnaphthalene	< 1	None available	None available
Naphthalene	< 1	2350	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan

Enclosed Bays and Estuaries Criteria			
Constituent Of Concern	**Background Level ug/l**	**Water Quality Objective ug/l**	**Reference for Objective**
Phenanthrene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Pyrene	< 1	300	U.S. EPA National Ambient Water Quality Criteria, Saltwater Aquatic Life Protection, lowest observed toxicity level, applied to the narrative TOXICITY objective in the Basin Plan
Phenol	< 1	10	U.S. EPA 1976 Water Quality Criteria, Marked tainting of oysters at 10 ug/l applied to the narrative TASTES AND ODORS objective of the Basin Plan
Arsenic	variable; site specific data required;	36	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan
Barium	variable; site specific data required	None available	None available
Copper	variable; site specific data required;	3.1	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan
Lead	variable; site specific data required;	8.1	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan
Zinc	variable; site specific data required;	81	California Toxic Rule Continuous 4-day average for aquatic life protection, applied to the narrative TOXICITY objective in the Basin Plan

15. Reasonable costs incurred by Regional Water Board staff in overseeing cleanup or abatement activities are reimbursable under Section 13304 of the California Water Code.

16. The issuance of this cleanup and abatement order is an enforcement action being taken for the protection of the environment and, therefore, is exempt from the provisions of the California Environmental Quality Act (Public Resources Code, Section 21000 et. seq.) in accordance with Section 15308 and 15321, Chapter 3, Title 14 of the California Code of Regulations.

THEREFORE, IT IS HEREBY ORDERED that pursuant to California Water Code Sections 13267(b) and 13304, the discharger shall cleanup and abate the discharges and threatened discharges and shall comply with the provisions of this Order:

1. The discharger shall conduct all work under the direction of a California registered engineer or geologist experienced in pollution investigation and cleanup in accordance with all local ordinances. All necessary permits shall be obtained.

2. By June 15, 2001 the discharger shall submit a workplan to collect soil samples across the Site for total threshold limit concentrations (TTLC) and corresponding soluble limit threshold concentrations (STLC) using the California Waste Extraction Test (WET) for hazardous waste characterization of metals, including arsenic, copper, and lead. The results of sampling shall be used to statistically validate the total metals concentrations, which will be applied during interim cleanup measures.

3. By September 15, 2001, the discharger shall submit for Executive Officer concurrence, an interim remedial action plan (IRAP). The IRAP shall include, but not be limited to, proposals for the following elements:

    a. Remedial actions to address onsite soil impacted with concentrations of Site contaminants correlating to either STLC or TTLC concentrations at or above the California Code of Regulations, Title 22 criteria for hazardous waste.
    b. Mitigation measures to prevent potential migration of residual soil contamination to groundwater and/or surface water bodies and a contingency plan to address any future discharges identified during monitoring activities;
    c. A detailed soil contingency plan, which must be implemented to address any potential subsurface activities at the site prior to development and implementation of the final RAP.
    d. An operation and maintenance plan to prevent ongoing illegal dumping of wastes at the Site and prevent the Site from continuing to be an attractive nuisance; and
    e. An implementation schedule for each task contained in the IRAP.

4. At least eight months prior to seeking or applying for any entitlement for development of the site, the discharger shall submit for Executive Officer concurrence, a final remedial action plan (RAP) proposing implementation of final remedial alternatives, which will achieve and/or continue to ensure compliance with Findings 12 and 13 above.

5. The discharger shall comply with Provisions of Monitoring and Reporting Program Order No. R1-2001-29, incorporated herein by this reference, and must submit monthly surface water monitoring reports by the 30th day of the month following sampling and/or runoff observation. Quarterly groundwater monitoring reports shall be submitted in accordance with the following schedule:

Reporting Period	**Due Date**
May, June, July	August 15
August, September, October	November 15
November, December, January	February 15
February, March, April	May 15

6. The discharger shall promptly pay in accordance with the invoicing instructions all invoices for Regional Water Board oversight.

7. If, for any reason, the discharger is unable to perform any activity or submit any documentation in compliance with the work schedule submitted pursuant to this Order and approved by the Executive Officer, the discharger may request, in writing, an extension of the time as specified. The extension request shall include justification for this delay. An extension may be granted for good cause, in which case this Order will be accordingly revised.

Ordered by: _____

Lee A. Michlin
Executive Officer

May 9, 2001